

Applicant gratefully acknowledges the Office Action indicating that claims 1, 4, 20 and 21 are allowed. Applicant also thanks Examiner Loke for the courtesies extended to Applicant's representative during the September 24 personal interview. The substance of the personal interview is incorporated in the Remarks below.

**I. Claims 12 and 22-30 Satisfy the Requirements Under 35 U.S.C. §112, First Paragraph**

The Office Action rejects claims 12 and 22-30 under 35 U.S.C. §112, first paragraph, as containing subject matter not described in the specification. This rejection is respectfully traversed.

The Office Action asserts that the specification does not disclose that the impurity concentration of the channel region is equal to or less than an impurity concentration in the drift region. However, the specification describes that an impurity concentration contained in the p-type channel (115) is set equal to or less than the impurity concentration in the n drift region 114. See, for example, page 8, lines 17-21. The specification also describes that the elements forming the third embodiment are similar to the elements consisting the second embodiment. See, for example, page 8, lines 32-34. The specification further describes that the difference between the third embodiment (Figs. 10A and 10B) and the second embodiment (Figs. 9A and 9B) is a physical relationship between the source region (120, 220) and p-type channel region (115, 215). See, for example, page 9, lines 1-3.

For at least these reasons, Applicant respectfully asserts that claims 12 and 22-30 are fully supported in the specification. Accordingly, withdrawal of the rejection of claims 12 and 22-30 under 35 U.S.C. §112, first paragraph, is respectfully solicited.

**II. Claims 28 and 29 Satisfy the Requirements Under 35 U.S.C. §112, Second Paragraph**

The Office Action rejects claims 28 and 29 under 35 U.S.C. §112, second paragraph, as being indefinite. In response, claims 28 and 29 are amended to obviate the rejection. Support for the feature of the gate region surrounding the channel region may be found at least in claim 12; specification page 4, lines 12-19 and page 5, lines 16-22. Support for the feature of the width of the opening portion c1 as being wider than the gate distance c2 is found in page 7, lines 21-28; and shown in Fig. 8. Withdrawal of the rejection of claims 28 and 29 under 35 U.S.C. §112, second paragraph, is respectfully solicited.

**III. Conclusion**

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the Applicant's representative at the telephone number listed below.

Respectfully submitted,



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Attachments:

Appendix  
Petition for Extension of Time

Date: October 3, 2002

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## APPENDIX

## Changes to Claims:

The following is a marked-up version of the amended claims:

12. (~~Four~~Five Times Amended) A semiconductor device comprising:
- a substrate having a first conductive type;
  - a drift region having the first conductive type and disposed on the substrate;
  - a channel region having a second conductive type different from the first conductive type and provided on the drift region;
  - a gate region provided so as to surround at least the channel region via an insulation film; and
  - a source region having the first conductive type and provided on the channel region, the source region is located substantially at a center of the channel region, ~~and the source region is isolated from the insulation film, wherein:~~  
\_\_\_\_\_ an impurity concentration of the channel region is equal to or less than an impurity concentration in the drift region, and a depletion layer forms over the entire channel region sandwiched between the gate region when a zero bias is applied to the gate region.
28. (Twice Amended) The semiconductor device according to claim 26, further comprising an insulation layer located between the semiconductor layer and the source electrode and having an opening portion for the semiconductor layer and the source electrode to contact, wherein a width of the opening portion is wider than a distance of the gate region surrounding at least the channel region.
29. (Twice Amended) The semiconductor device according to claim 27, further comprising an insulation layer located between the semiconductor layer and the source electrode, and having an opening portion for the semiconductor layer and the source electrode to contact, wherein a width of the opening portion is wider than a space of the gate region surrounding at least the channel region.

30. (Twice Amended) A semiconductor device comprising:

- a substrate having a first conductive type;
- a drift region having the first conductive type and disposed on the substrate;
- a channel region having a first conductive type and provided on the drift region; and
- a gate region provided so as to surround at least the channel region via an insulation film; ~~and~~
- ~~\_\_\_\_\_ a source region having the first conductive type and provided on the channel~~

~~region, wherein:~~

- ~~\_\_\_\_\_ an impurity concentration in the channel region is equal to or less than an~~

~~impurity concentration in the drift region, and a depletion layer forms over the entire channel region sandwiched between the gate region when a zero bias is applied to the gate region.~~